

MPM1D Quiz 1: Integers and Rational Numbers

1. Evaluate each of the following.

a) $(4-8) \times (18-11)$

b) $(4-8) \times 18 - 11$

c) $4 - 8 \times 18 - 11$

d) $4 - 8 \times (18 - 11)$

e) $3\frac{1}{2} \div 2\frac{1}{4}$

f) $2 + (-5) \times (6-9)^2$

g) $\left(-2\frac{1}{2}\right)^3 - (-4)$

h) $\frac{(-6) - (-10)}{(1-3)^2 \times 6}$

2. Solve each problem and include a “Therefore” statement.

a) How much of a pizza does each person get if $2\frac{1}{2}$ pizzas are divided evenly among 8 people?

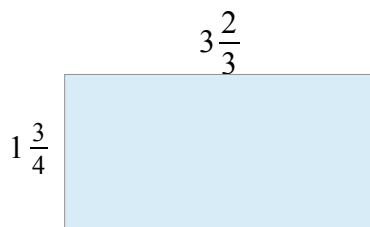
b) What is the speed of a car (in kilometres per hour) if it has travelled 420 km in 140 minutes?
Hint: How many hours is this?
Also, speed = distance \div time

c) What is the volume of a cube with side length $2\frac{1}{3}$ cm?

3. These are challenges.

a) List 3 fractions that are between $\frac{1}{4}$ and $\frac{2}{5}$. Explain how you got them.

b) What is the area of this rectangle?



Answers

1. Evaluate each of the following.

$$\begin{aligned} \text{a)} \quad & (4-8) \times (18-11) \\ & = (-4) \times (7) \\ & = -28 \end{aligned}$$

$$\begin{aligned} \text{b)} \quad & (4-8) \times 18 - 11 \\ & = (-4) \times 18 - 11 \\ & = -72 - 11 \\ & = -83 \end{aligned}$$

$$\begin{aligned} \text{c)} \quad & 4 - 8 \times 18 - 11 \\ & = 4 - 144 - 11 \\ & = -140 - 11 \\ & = -151 \end{aligned}$$

$$\begin{aligned} \text{d)} \quad & 4 - 8 \times (18 - 11) \\ & = 4 - 8 \times (7) \\ & = 4 - 56 \\ & = -52 \end{aligned}$$

$$\begin{aligned} \text{e)} \quad & 3\frac{1}{2} \div 2\frac{1}{4} \\ & = \frac{7}{2} \div \frac{9}{4} \\ & = \frac{7}{2} \times \frac{4}{9} \\ & = \frac{28}{18} \\ & = \frac{14}{9} \end{aligned}$$

$$\begin{aligned} \text{f)} \quad & 2 + (-5) \times (6-9)^2 \\ & = 2 + (-5) \times (-3)^2 \\ & = 2 + (-5) \times 9 \\ & = 2 + (-45) \\ & = -43 \end{aligned}$$

$$\begin{aligned} \text{g)} \quad & \left(-2\frac{1}{2}\right)^3 - (-4) \\ & = \left(\frac{-5}{2}\right)^3 + 4 \\ & = \frac{(-5)^3}{2^3} + 4 \\ & = \frac{-125}{8} + 4 \\ & = \frac{-125}{8} + \frac{32}{8} = \frac{-93}{8} \end{aligned}$$

$$\begin{aligned} \text{h)} \quad & \frac{(-6) - (-10)}{(1-3)^2 \times 6} \\ & = \frac{(-6) + 10}{(2)^2 \times 6} \\ & = \frac{4}{4 \times 6} \\ & = \frac{4}{24} \\ & = \frac{1}{6} \end{aligned}$$

2. Solve each problem and include a “Therefore” statement.

a) How much of a pizza does each person get if $2\frac{1}{2}$ pizzas are divided evenly among 8 people?

$$2\frac{1}{2} \div 8 = \frac{5}{2} \times \frac{1}{8} = \frac{5}{16}$$

Therefore each person gets $\frac{5}{16}$ of a pizza.

b) What is the speed of a car (in kilometres per hour) if it has travelled 420 km in 140 minutes?

Hint: How many hours is this?

Also, speed = distance \div time

120 minutes = 2 hours

20 minutes = $\frac{1}{3}$ of an hour

140 minutes = $2\frac{1}{3}$ hours.

$$\text{speed} = \text{distance} \div \text{time} = 420 \div 2\frac{1}{3} = 420 \div \frac{7}{3} = \frac{420}{1} \times \frac{3}{7} = \frac{1260}{7} = 180 \text{ km/h}$$

Therefore the car travelled at 180 km/h/

c) What is the volume of a cube with side length $2\frac{1}{3}$ cm?

$$V = s^3 = \left(2\frac{1}{3}\right)^3 = \left(\frac{7}{3}\right)^3 = \frac{7^3}{3^3} = \frac{343}{27}$$

So the cube has a volume of $\frac{343}{27}$ cm³

^ This is $12\frac{19}{27}$ cm³

3. These are challenges.

a) List 3 fractions that are between $\frac{1}{4}$ and $\frac{2}{5}$. Explain how you got them.

Anything that is between 0.25 and 0.4 on the calculator works.

My method: $\frac{1}{4} = \frac{5}{20} = 10$ over 40

$\frac{2}{5} = \frac{8}{20} = 16$ over 40

So valid answers are $\frac{11}{40}$, $\frac{12}{40}$, $\frac{13}{40}$, $\frac{14}{40}$, $\frac{15}{40}$.

There are MANY MANY other answers that are possible.

b) What is the area of this rectangle?

$$A = \left(3\frac{2}{3}\right) \times \left(1\frac{3}{4}\right) = \frac{11}{3} \times \frac{7}{4} = \frac{77}{12}$$

This rectangle has area $\frac{77}{12}$.

Which is the same as $6\frac{5}{12}$

